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5 <212> PRT
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Asp Asp Val Leu Phe Ala Leu Asp Pro Tyr
1 5 10
15
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20 <212> PRT
<213> human cytomegalovirus gH CTL epitope peptide
25
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His Glu Leu Leu Val Leu Val Lys Lys Ala Gln Leu
30 1 5 10
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35 <211> 12
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<213> human cytomegalovirus gH CTL epitope peptide
40
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45 Leu Thr Val Ser Glu His Val Ser Tyr Val Val Thr
1 5 10
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55 <213> human cytomegalovirus gH CTL epitope peptide

<400> 249

5 Arg Gln Thr Glu Lys His Glu Leu Leu Val Leu Val Lys Lys Ala Gln
1 5 10 15

10 Leu Asn Arg His
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<210> 250

15 <211> 20

<212> PRT

20 <213> human cytomegalovirus gH CTL epitope peptide

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30 Leu Ile Lys Gly
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<210> 251

35 <211> 9

<212> PRT

40 <213> human cytomegalovirus IE2 CTL epitope peptide

<400> 251

45 Phe Leu Met Glu His Thr Met Pro Val
1 5

<210> 252

50 <211> 9

<212> PRT

55 <213> human cytomegalovirus IE2 CTL epitope peptide

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5 Leu Met Gln Lys Phe Pro Lys Gln Val
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<210> 253

10 <211> 9

<212> PRT

15 <213> human cytomegalovirus IE2 CTL epitope peptide

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20 Asn Leu Ala Leu Ser Thr Pro Phe Leu
1 5

<210> 254

<211> 9

<212> PRT

30 <213> human cytomegalovirus IE2 CTL epitope peptide

<400> 254

35 Ile Ile Tyr Thr Arg Asn His Glu Val
1 5

<210> 255

<211> 10

45 <212> PRT

<213> human cytomegalovirus IE2 CTL epitope peptide .

<400> 255

50 Ile Ile Tyr Thr Arg Asn His Glu Val Lys
1 5 10

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77

<210> 256
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Leu Leu Gly Ala Leu Asn Leu Cys Leu
1 5
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<210> 257
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20 <212> PRT
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25
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Lys Pro Glu Pro Asp Phe Thr Ile Gln Tyr
30 1 5 10
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35 <211> 9
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45 Ile Met Lys Asp Lys Asn Thr Pro Phe
1 5
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55 <213> human cytomegalovirus IE2 CTL epitope peptide

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5 Pro Arg Lys Lys Lys Ser Lys Arg Ile
1 5

<210> 260

10 <211> 9

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15 <213> human cytomegalovirus IE2 CTL epitope peptide

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25 <210> 261

<211> 8

<212> PRT

30 <213> human cytomegalovirus IE2 CTL epitope peptide

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35 Phe Glu Gln Pro Thr Glu Thr Pro
1 5

40 <210> 262

<211> 10

45 <212> PRT

<213> human cytomegalovirus IE2 CTL epitope peptide

50 <400> 262

Phe Glu Gln Pro Thr Glu Thr Pro Pro Glu
1 5 10

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Glu Gln Pro Thr Glu Thr Pro Pro Glu
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<211> 11
20 <212> PRT
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Gln Phe Glu Gln Pro Thr Glu Thr Pro Pro Glu
30 1 5 10
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35 <211> 9
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1 5
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 5 Tyr Arg Asn Met Ile Ile His Ala Ala Thr
 1 5 10
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 10 <211> 9
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 20 Cys Leu Pro Leu Met Gln Lys Phe Pro
 1 5
 25 <210> 268
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 35 <400> 268
 Ile Asp Glu Val Ser Arg Met Phe Arg Asn Thr Asn Arg Ser
 1 5 10
 40 <210> 269
 <211> 20
 45 <212> PRT
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 50 <400> 269
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 1 5 10 15
 55 Thr Pro Pro Glu

81

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5 <210> 270
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 10 <213> human cytomegalovirus IE2 CTL epitope peptide

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 15 Phe Glu Gln Pro Thr Glu Thr Pro Pro Glu Asp Leu Asp Thr Leu Ser
 1 5 10 15

 20 Leu Ala Ile Glu
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 <210> 271
 25 <211> 20
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 30 <213> human cytomegalovirus IE2 CTL epitope peptide

 <400> 271
 35 Met Leu Pro Leu Ile Lys Gln Glu Asp Ile Lys Pro Glu Pro Asp Phe
 1 5 10 15

 40 Thr Ile Gln Tyr
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 <210> 272
 45 <211> 20
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 50 <213> human cytomegalovirus IE2 CTL epitope peptide

 <400> 272
 55 Thr His Gln Leu Cys Pro Arg Ser Ser Asp Tyr Arg Asn Met Ile Ile
 1 5 10 15

5 His Ala Ala Thr
 20
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 <211> 20
 10 <212> PRT
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 15
 <400> 273
 Tyr Arg Asn Met Ile Ile His Ala Ala Thr Pro Val Asp Leu Leu Gly
 20 1 5 10 15
 Ala Leu Asn Leu
 25 20
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 <211> 20
 30 <212> PRT
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 35
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 Thr Gly Pro Arg Lys Lys Lys Ser Lys Arg Ile Ser Glu Leu Asp Asn
 40 1 5 10 15
 Glu Lys Val Arg
 45 20
 <210> 275
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 50 <212> PRT
 <213> human cytomegalovirus IE2 CTL epitope peptide
 55
 <400> 275

Pro Val Asp Leu Leu Gly Ala Leu Asn Leu Cys Leu Pro Leu Met Gln
 1 5 10 15

5
 Lys Phe Pro Lys
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10 <210> 276
 <211> 20
 <212> PRT
 15 <213> human cytomegalovirus IE2 CTL epitope peptide

20 <400> 276
 Ile Gln Ile Ile Tyr Thr Arg Asn His Glu Val Lys Ser Glu Val Asp
 1 5 10 15

25
 Ala Val Arg Cys
 20

30 <210> 277
 <211> 20
 <212> PRT
 35 <213> human cytomegalovirus IE2 CTL epitope peptide

40 <400> 277
 Val Lys Ser Glu Val Asp Ala Val Arg Cys Arg Leu Gly Thr Met Cys
 1 5 10 15

45
 Asn Leu Ala Leu
 20

50 <210> 278
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 <212> PRT
 55 <213> human cytomegalovirus IE2 CTL epitope peptide

<400> 278

5 Arg Val Lys Ile Asp Glu Val Ser Arg Met Phe Arg Asn Thr Asn Arg
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10 Ser Leu Glu Tyr
20

<210> 279

15 <211> 20

<212> PRT

20 <213> human cytomegalovirus IE2 CTL epitope peptide

<400> 279

25 Ser Ser Ser Ser Ser Ser Cys Ser Ser Ala Ser Asp Ser Glu Ser Glu
1 5 10 15

30 Ser Glu Glu Met
20

<210> 280

35 <211> 20

<212> PRT

40 <213> human cytomegalovirus IE2 CTL epitope peptide

<400> 280

45 Ala Ser Ser Pro Ser Thr Gly Ser Gly Thr Pro Arg Asx Thr Ser Pro
1 5 10 15

50 Thr His Pro Leu
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<210> 281

55 <211> 20

85

<212> PRT

<213> human cytomegalovirus IE2 CTL epitope peptide

5

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10 Pro Arg Val Thr Ser Pro Thr His Pro Leu Ser Gln Met Asn His Pro
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Pro Leu Pro Asp
20

15

<210> 282

<211> 20

20

<212> PRT

<213> human cytomegalovirus IE2 CTL epitope peptide

25

<400> 282

30 Pro Leu Gly Arg Pro Asp Glu Asp Ser Ser Ser Ser Ser Ser Ser
1 5 10 15

Cys Ser Ser Ala
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35

<210> 283

<211> 20

40

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<213> human cytomegalovirus IE2 CTL epitope peptide

45

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50 Ser Asp Ser Glu Ser Glu Ser Glu Glu Met Lys Cys Ser Ser Gly Gly
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Gly Ala Ser Val
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55

86

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15 Arg Gly Gly Phe
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Cys Thr Pro Asn Val Gln Thr Arg Arg Gly Arg Val Lys Ile Asp Glu
1 5 10 15
35 Val Ser Arg Met
20
40
<210> 286
<211> 20
45 <212> PRT
<213> human cytomegalovirus IE2 CTL epitope peptide
50
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Phe Arg Asn Thr Asn Arg Ser Leu Glu Tyr Lys Asn Leu Pro Phe Thr
1 5 10 15
55 Ile Pro Ser Met

87

20

5 <210> 287
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 10 <213> human cytomegalovirus IE2 CTL epitope peptide

 <400> 287
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 20 Asn Asn Lys Gly
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 <210> 288
 25 <211> 20
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 30 <213> human cytomegalovirus IE2 CTL epitope peptide

 <400> 288
 35 Cys Lys Thr Met Gln Val Asn Asn Lys Gly Ile Gln Ile Ile Tyr Thr
 1 5 10 15
 40 Arg Asn His Glu
 20

 <210> 289
 45 <211> 20
 <212> PRT
 50 <213> human cytomegalovirus IE2 CTL epitope peptide

 <400> 289
 55 Lys Ala Ala Trp Ser Leu Lys Glu Leu His Thr His Gln Leu Cys Pro
 1 5 10 15

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Arg Ser Ser Asp
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5
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<211> 20
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15
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Cys Leu Pro Leu Met Gln Lys Phe Pro Lys Gln Val Met Val Arg Ile
20 1 5 10 15
Phe Ser Thr Asn
      20
25
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30
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35
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Gly Glu Ile Asn Ile Thr Phe Ile His Tyr
40 1 5 10
<210> 292
45
<211> 10
<212> PRT
<213> human cytomegalovirus UL18 CTL epitope peptide.
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<400> 292
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Thr Glu Asn Gly Ser Phe Val Ala Gly Tyr
1 5 10

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10
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Thr Met Trp Cys Leu Thr Leu Phe Val
15 1 5
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20 <211> 9
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30 Leu Leu Val Leu Phe Ile Val Tyr Val
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35 <211> 9
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40 <213> human cytomegalovirus US2 CTL epitope peptide
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45 Ser Met Met Trp Met Arg Phe Phe Val
1 5
50 <210> 296
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<212> PRT
55 <213> human cytomegalovirus US2 CTL epitope peptide

<400> 296

5 Thr Leu Leu Val Leu Phe Ile Val Tyr Val
1 5 10

<210> 297

10 <211> 9

<212> PRT

15 <213> human cytomegalovirus US2 CTL epitope peptide

<400> 297

20 Val Tyr Val Thr Val Asp Cys Asn Leu
1 5

25 <210> 298

<211> 9

<212> PRT

30 <213> human cytomegalovirus US3 CTL epitope peptide

35 <400> 298

Tyr Leu Phe Ser Leu Val Val Leu Val
1 5

40 <210> 299

<211> 9

45 <212> PRT

<213> human cytomegalovirus US3 CTL epitope peptide

50 <400> 299

Thr Leu Leu Val Tyr Leu Phe Ser Leu
1 5

55

91

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1 5 10
15
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20 <212> PRT
<213> human cytomegalovirus US3 CTL epitope peptide
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Val Tyr Leu Phe Ser Leu Val Val Leu
30 1 5
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35 <211> 9
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45 Tyr Tyr Val Glu Cys Glu Pro Arg Cys
1 5
50
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55 <213> human cytomegalovirus US6 CTL epitope peptide

<400> 303
5 Leu Tyr Leu Cys Cys Gly Ile Thr Leu
1 5

<210> 304
10 <211> 10
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15 <213> human cytomegalovirus US11 CTL epitope peptide

<400> 304
20 Thr Leu Phe Asp Glu Pro Pro Pro Leu Val
1 5 10

<210> 305
25 <211> 9
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30 <213> human cytomegalovirus US11 CTL epitope peptide

<400> 305
35 Thr Pro Arg Val Tyr Tyr Gln Thr Leu
1 5

<210> 306
40 <211> 10
45 <212> PRT
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50 Ala Pro Val Ala Gly Ser Met Pro Glu Leu
1 5 10
55

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 <211> 9
 5 <212> PRT
 <213> human cytomegalovirus US11 CTL epitope peptide
 10
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 Ser Glu Ser Leu Val Ala Lys Arg Tyr
 1 5
 15
 <210> 308
 <211> 9
 20 <212> PRT
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 25
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 Leu Glu Leu Glu Ile Ala Leu Gly Tyr
 30 1 5
 <210> 309
 35 <211> 241
 <212> PRT
 <213> synthetic polyepitope peptide
 40
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 45 Val Thr Glu His Asp Thr Leu Leu Tyr Asn Leu Val Pro Met Val Ala
 1 5 10 15
 Thr Val Val Leu Glu Glu Thr Ser Val Met Leu Arg Ile Phe Ala Glu
 50 20 25 30
 Leu Glu Gly Val Ile Ile Tyr Thr Arg Asn His Glu Val Ile Met Arg
 55 35 40 45
 Glu Phe Asn Ser Tyr Lys Ala Tyr Ala Gln Lys Ile Phe Lys Ile Leu

94

	50		55		60
5	Gln Tyr Asp Pro Val Ala Ala Leu Phe Tyr Val Lys Tyr Val Tyr Glu				
	65		70		75 80
10	Ser Phe Asp Ile Tyr Arg Ile Phe Ala Glu Leu Asn Val Arg Arg Ser				
		85		90	95
15	Trp Glu Glu Leu Lys Ala Arg Asp His Leu Ala Val Leu Gln Ala Arg				
		100		105	110
20	Leu Thr Val Ser Gly Leu Lys Ala Arg Ala Lys Lys Asp Glu Leu Gln				
		115		120	125
25	Ile Lys Val Arg Val Asp Met Val Glu Leu Lys Arg Lys Met Met Tyr				
		130		135	140
30	Met Arg Arg Arg His Arg Gln Asp Ala Leu Ala Arg Val Tyr Glu Ile				
		145		150	155 160
35	Lys Cys Arg Cys Pro Ser Gln Glu Pro Met Ser Ile Tyr Val Tyr Phe				
		165		170	175
40	Glu Gln Pro Thr Glu Thr Pro Pro Tyr Ala Tyr Ile Tyr Thr Thr Tyr				
		180		185	190
45	Leu Gln Glu Phe Phe Trp Asp Ala Asn Asp Ile Tyr Tyr Glu Gln His				
		195		200	205
50	Lys Ile Thr Ser Tyr Gln Glu Pro Met Ser Ile Tyr Val Tyr Ser Glu				
		210		215	220
55	His Pro Thr Phe Thr Ser Gln Tyr Gln Ala Ile Arg Glu Thr Val Glu				
		225		230	235 240
	Leu				
	<210>	310			
	<211>	241			
	<212>	PRT			

95

<213> synthetic polypeptide

5 <400> 310

Asn Val Arg Arg Ser Trp Glu Glu Leu Val Thr Glu His Asp Thr Leu
 1 5 10 15

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Leu Tyr Ala Tyr Ala Gln Lys Ile Phe Lys Ile Leu Asn Leu Val Pro
 20 25 30

15

Met Val Ala Thr Val Val Leu Glu Glu Thr Ser Val Met Leu Gln Glu
 35 40 45

20

Pro Met Ser Ile Tyr Val Tyr Ser Glu His Pro Thr Phe Thr Ser Gln
 50 55 60

25

Tyr Gln Ile Lys Val Arg Val Asp Met Val Glu Leu Lys Arg Lys Met
 65 70 75 80

Met Tyr Met Arg Ile Phe Ala Glu Leu Glu Gly Val Ile Ile Tyr Thr
 85 90 95

30

Arg Asn His Glu Val Tyr Glu Gln His Lys Ile Thr Ser Tyr Gln Ala
 100 105 110

35

Ile Arg Glu Thr Val Glu Leu Ile Met Arg Glu Phe Asn Ser Tyr Lys
 115 120 125

40

Cys Pro Ser Gln Glu Pro Met Ser Ile Tyr Val Tyr Gln Tyr Asp Pro
 130 135 140

45

Val Ala Ala Leu Phe Lys Ala Arg Asp His Leu Ala Val Leu Tyr Val
 145 150 155 160

Lys Tyr Val Tyr Glu Ser Phe Asp Ile Tyr Arg Ile Phe Ala Glu Leu
 165 170 175

50

Phe Glu Gln Pro Thr Glu Thr Pro Pro Tyr Ala Tyr Ile Tyr Thr Thr
 180 185 190

55

Tyr Leu Gln Ala Arg Leu Thr Val Ser Gly Leu Lys Ala Arg Ala Lys
 195 200 205

Lys Asp Glu Leu Arg Arg Arg His Arg Gln Asp Ala Leu Ala Arg Val
 210 215 220

5

Tyr Glu Ile Lys Cys Arg Gln Glu Phe Phe Trp Asp Ala Asn Asp Ile
 225 230 235 240

10 Tyr

<210> 311

15 <211> 250

<212> PRT

20 <213> synthetic polyepitope peptide

<400> 311

25

Tyr Val Lys Tyr Val Tyr Glu Ser Phe Asn Leu Val Pro Met Val Ala
 1 5 10 15

30

Thr Val Gln Ile Lys Val Arg Val Asp Met Val Val Leu Glu Glu Thr
 20 25 30

35

Ser Val Met Leu Lys Ala Arg Asp His Leu Ala Val Leu Ala Tyr Ala
 35 40 45

40

Gln Lys Ile Phe Lys Ile Leu Val Thr Glu His Asp Thr Leu Leu Tyr
 50 55 60

45

Tyr Ala Tyr Ile Tyr Thr Thr Tyr Leu Gln Glu Phe Phe Trp Asp Ala
 65 70 75 80

50

Asn Asp Ile Tyr Gln Glu Pro Met Ser Ile Tyr Val Tyr Arg Ile Phe
 85 90 95

55

Ala Glu Leu Glu Gly Val Ile Ile Tyr Thr Arg Asn His Glu Val Ile
 100 105 110

Met Arg Glu Phe Asn Ser Tyr Lys Ser Glu His Pro Thr Phe Thr Ser
 115 120 125

97

Gln Tyr Gln Ala Arg Leu Thr Val Ser Gly Leu Gln Tyr Asp Pro Val
 130 135 140

5 Ala Ala Leu Phe Tyr Glu Gln His Lys Ile Thr Ser Tyr Gln Ala Ile
 145 150 155 160

10 Arg Glu Thr Val Glu Leu Tyr Val Lys Tyr Val Tyr Glu Ser Phe Asp
 165 170 175

15 Ile Tyr Arg Ile Phe Ala Glu Leu Asn Val Arg Arg Ser Trp Glu Glu
 180 185 190

Leu Lys Ala Arg Ala Lys Lys Asp Glu Leu Glu Leu Lys Arg Lys Met
 195 200 205

20 Met Tyr Met Arg Arg Arg His Arg Gln Asp Ala Leu Ala Arg Val Tyr
 210 215 220

25 Glu Ile Lys Cys Arg Cys Pro Ser Gln Glu Pro Met Ser Ile Tyr Val
 225 230 235 240

30 Tyr Phe Glu Gln Pro Thr Glu Thr Pro Pro
 245 250

<210> 312

35 <211> 241

<212> PRT

40 <213> synthetic polypeptide

<400> 312

45 Asn Val Arg Arg Ser Trp Glu Glu Leu Lys Ala Arg Asp His Leu Ala
 1 5 10 15

50 Val Leu Gln Ala Arg Leu Thr Val Ser Gly Leu Lys Ala Arg Ala Lys
 20 25 30

55 Lys Asp Glu Leu Gln Ile Lys Val Arg Val Asp Met Val Glu Leu Lys
 35 40 45

Arg Lys Met Met Tyr Met Arg Arg Arg His Arg Gln Asp Ala Leu Ala

98

	50		55		60
5	Arg Val Tyr Glu Ile Lys Cys Arg Cys Pro Ser Gln Glu Pro Met Ser	65	70	75	80
10	Ile Tyr Val Tyr Phe Glu Gln Pro Thr Glu Thr Pro Pro Tyr Ala Tyr	85	90	95	
15	Ile Tyr Thr Thr Tyr Leu Gln Glu Phe Phe Trp Asp Ala Asn Asp Ile	100	105	110	
20	Tyr Tyr Glu Gln His Lys Ile Thr Ser Tyr Gln Glu Pro Met Ser Ile	115	120	125	
25	Tyr Val Tyr Ser Glu His Pro Thr Phe Thr Ser Gln Tyr Gln Ala Ile	130	135	140	
30	Arg Glu Thr Val Glu Leu Val Thr Glu His Asp Thr Leu Leu Tyr Asn	145	150	155	160
35	Leu Val Pro Met Val Ala Thr Val Val Leu Glu Glu Thr Ser Val Met	165	170	175	
40	Leu Arg Ile Phe Ala Glu Leu Glu Gly Val Ile Ile Tyr Thr Arg Asn	180	185	190	
45	His Glu Val Ile Met Arg Glu Phe Asn Ser Tyr Lys Ala Tyr Ala Gln	195	200	205	
50	Lys Ile Phe Lys Ile Leu Gln Tyr Asp Pro Val Ala Ala Leu Phe Tyr	210	215	220	
55	Val Lys Tyr Val Tyr Glu Ser Phe Asp Ile Tyr Arg Ile Phe Ala Glu	225	230	235	240
	Leu				
	<210>	313			
	<211>	241			
	<212>	PRT			

<213> synthetic polypeptide

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Cys Pro Ser Gln Glu Pro Met Ser Ile Tyr Val Tyr Phe Glu Gln Pro
 1 5 10 15

10 Thr Glu Thr Pro Pro Tyr Ala Tyr Ile Tyr Thr Thr Tyr Leu Gln Glu
 20 25 30

15 Phe Phe Trp Asp Ala Asn Asp Ile Tyr Tyr Glu Gln His Lys Ile Thr
 35 40 45

20 Ser Tyr Gln Glu Pro Met Ser Ile Tyr Val Tyr Ser Glu His Pro Thr
 50 55 60

25 Phe Thr Ser Gln Tyr Val Thr Glu His Asp Thr Leu Leu Tyr Asn Leu
 65 70 75 80

Val Pro Met Val Ala Thr Val Val Leu Glu Glu Thr Ser Val Met Leu
 85 90 95

30 Arg Ile Phe Ala Glu Leu Glu Gly Val Ile Ile Tyr Thr Arg Asn His
 100 105 110

35 Glu Val Ile Met Arg Glu Phe Asn Ser Tyr Lys Asn Val Arg Arg Ser
 115 120 125

40 Trp Glu Glu Leu Lys Ala Arg Asp His Leu Ala Val Leu Gln Ala Arg
 130 135 140

45 Leu Thr Val Ser Gly Leu Lys Ala Arg Ala Lys Lys Asp Glu Leu Gln
 145 150 155 160

Ile Lys Val Arg Val Asp Met Val Glu Leu Lys Arg Lys Met Met Tyr
 165 170 175

50 Met Arg Arg Arg His Arg Gln Asp Ala Leu Ala Arg Val Tyr Glu Ile
 180 185 190

55 Lys Cys Arg Ala Tyr Ala Gln Lys Ile Phe Lys Ile Leu Gln Tyr Asp
 195 200 205

100

Pro Val Ala Ala Leu Phe Tyr Val Lys Tyr Val Tyr Glu Ser Phe Asp
 210 215 220

5 Ile Tyr Arg Ile Phe Ala Glu Leu Gln Ala Ile Arg Glu Thr Val Glu
 225 230 235 240

10 Leu

<210> 314
 15 <211> 241
 <212> PRT
 20 <213> synthetic polyepitope peptide

<400> 314
 25 Ala Tyr Ala Gln Lys Ile Phe Lys Ile Leu Asn Leu Val Pro Met Val
 1 5 10 15

30 Ala Thr Val Asn Val Arg Arg Ser Trp Glu Glu Leu Glu Leu Lys Arg
 20 25 30

35 Lys Met Met Tyr Met Val Thr Glu His Asp Thr Leu Leu Tyr Phe Glu
 35 40 45

40 Gln Pro Thr Glu Thr Pro Pro Ala Arg Val Tyr Glu Ile Lys Cys Arg
 50 55 60

Arg Ile Phe Ala Glu Leu Glu Gly Val Val Leu Glu Glu Thr Ser Val
 65 70 75 80

45 Met Leu Cys Pro Ser Gln Glu Pro Met Ser Ile Tyr Val Tyr Ile Ile
 85 90 95

50 Tyr Thr Arg Asn His Glu Val Arg Arg Arg His Arg Gln Asp Ala Leu
 100 105 110

55 Ile Met Arg Glu Phe Asn Ser Tyr Lys Gln Ile Lys Val Arg Val Asp
 115 120 125

101

Met Val Tyr Glu Gln His Lys Ile Thr Ser Tyr Gln Tyr Asp Pro Val
 130 135 140

5 Ala Ala Leu Phe Ser Glu His Pro Thr Phe Thr Ser Gln Tyr Gln Glu
 145 150 155 160

10 Phe Phe Trp Asp Ala Asn Asp Ile Tyr Tyr Val Lys Tyr Val Tyr Glu
 165 170 175

15 Ser Phe Asp Ile Tyr Arg Ile Phe Ala Glu Leu Lys Ala Arg Asp His
 180 185 190

Leu Ala Val Leu Gln Ala Arg Leu Thr Val Ser Gly Leu Lys Ala Arg
 195 200 205

20 Ala Lys Lys Asp Glu Leu Tyr Ala Tyr Ile Tyr Thr Thr Tyr Leu Gln
 210 215 220

25 Glu Pro Met Ser Ile Tyr Val Tyr Gln Ala Ile Arg Glu Thr Val Glu
 225 230 235 240

30 Leu

<210> 315

35 <211> 241

<212> PRT

<213> synthetic polyepitope peptide

40

<400> 315

45 Tyr Glu Gln His Lys Ile Thr Ser Tyr Gln Glu Pro Met Ser Ile Tyr
 1 5 10 15

50 Val Tyr Glu Leu Lys Arg Lys Met Met Tyr Met Arg Arg Arg His Arg
 20 25 30

Gln Asp Ala Leu Ala Arg Val Tyr Glu Ile Lys Cys Arg Ala Tyr Ala
 35 40 45

55 Gln Lys Ile Phe Lys Ile Leu Gln Tyr Asp Pro Val Ala Ala Leu Phe

102

	50	55	60
5	Tyr Val Lys Tyr Val Tyr Glu Ser Phe Asp Ile Tyr Arg Ile Phe Ala 65 70 75 80		
10	Glu Leu Ser Glu His Pro Thr Phe Thr Ser Gln Tyr Gln Ala Ile Arg 85 90 95		
15	Glu Thr Val Glu Leu Asn Val Arg Arg Ser Trp Glu Glu Leu Lys Ala 100 105 110		
20	Arg Ala Lys Lys Asp Glu Leu Val Thr Glu His Asp Thr Leu Leu Tyr 115 120 125		
25	Asn Leu Val Pro Met Val Ala Thr Val Val Leu Glu Glu Thr Ser Val 130 135 140		
30	Met Leu Arg Ile Phe Ala Glu Leu Glu Gly Val Ile Ile Tyr Thr Arg 145 150 155 160		
35	Asn His Glu Val Ile Met Arg Glu Phe Asn Ser Tyr Lys Gln Ile Lys 165 170 175		
40	Val Arg Val Asp Met Val Phe Glu Gln Pro Thr Glu Thr Pro Pro Tyr 180 185 190		
45	Ala Tyr Ile Tyr Thr Thr Tyr Leu Gln Glu Phe Phe Trp Asp Ala Asn 195 200 205		
50	Asp Ile Tyr Lys Ala Arg Asp His Leu Ala Val Leu Gln Ala Arg Leu 210 215 220		
55	Thr Val Ser Gly Leu Cys Pro Ser Gln Glu Pro Met Ser Ile Tyr Val 225 230 235 240		
	Tyr		
	<210> 316		
	<211> 241		
	<212> PRT		

103

<213> synthetic polypeptide

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Gln Ile Lys Val Arg Val Asp Met Val Ala Arg Val Tyr Glu Ile Lys
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10 Cys Arg Asn Leu Val Pro Met Val Ala Thr Val Tyr Val Lys Tyr Val
20 25 30

15 Tyr Glu Ser Phe Arg Ile Phe Ala Glu Leu Glu Gly Val Tyr Ala Tyr
35 40 45

20 Ile Tyr Thr Thr Tyr Leu Ile Ile Tyr Thr Arg Asn His Glu Val Ile
50 55 60

25 Met Arg Glu Phe Asn Ser Tyr Lys Ser Glu His Pro Thr Phe Thr Ser
65 70 75 80

Gln Tyr Ala Tyr Ala Gln Lys Ile Phe Lys Ile Leu Gln Tyr Asp Pro
85 90 95

30 Val Ala Ala Leu Phe Asp Ile Tyr Arg Ile Phe Ala Glu Leu Gln Glu
100 105 110

35 Phe Phe Trp Asp Ala Asn Asp Ile Tyr Asn Val Arg Arg Ser Trp Glu
115 120 125

40 Glu Leu Lys Ala Arg Asp His Leu Ala Val Leu Val Leu Glu Glu Thr
130 135 140

45 Ser Val Met Leu Gln Ala Arg Leu Thr Val Ser Gly Leu Lys Ala Arg
145 150 155 160

Ala Lys Lys Asp Glu Leu Glu Leu Lys Arg Lys Met Met Tyr Met Val
165 170 175

50 Thr Glu His Asp Thr Leu Leu Tyr Gln Glu Pro Met Ser Ile Tyr Val
180 185 190

55 Tyr Arg Arg Arg His Arg Gln Asp Ala Leu Cys Pro Ser Gln Glu Pro
195 200 205

104

Met Ser Ile Tyr Val Tyr Phe Glu Gln Pro Thr Glu Thr Pro Pro Tyr
 210 215 220

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Glu Gln His Lys Ile Thr Ser Tyr Gln Ala Ile Arg Glu Thr Val Glu
 225 230 235 240

10 Leu

<210> 317

15 <211> 241

<212> PRT

20 <213> synthetic polypeptide

<400> 317

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Asp Ile Tyr Arg Ile Phe Ala Glu Leu Cys Pro Ser Gln Glu Pro Met
 1 5 10 15

30 Ser Ile Tyr Val Tyr Gln Ala Ile Arg Glu Thr Val Glu Leu Lys Ala

20 25 30

35 Arg Asp His Leu Ala Val Leu Asn Leu Val Pro Met Val Ala Thr Val

35 35 40 45

Tyr Val Lys Tyr Val Tyr Glu Ser Phe Val Leu Glu Glu Thr Ser Val
 50 55 60

40

Met Leu Asn Val Arg Arg Ser Trp Glu Glu Leu Ile Met Arg Glu Phe
 65 70 75 80

45

Asn Ser Tyr Lys Ala Tyr Ala Gln Lys Ile Phe Lys Ile Leu Glu Leu
 85 90 95

50 Lys Arg Lys Met Met Tyr Met Gln Tyr Asp Pro Val Ala Ala Leu Phe

100 105 110

Ser Glu His Pro Thr Phe Thr Ser Gln Tyr Gln Ala Arg Leu Thr Val
 115 120 125

55

105

Ser Gly Leu Lys Ala Arg Ala Lys Lys Asp Glu Leu Gln Ile Lys Val
 130 135 140

5 Arg Val Asp Met Val Arg Arg Arg His Arg Gln Asp Ala Leu Ala Arg
 145 150 155 160

10 Val Tyr Glu Ile Lys Cys Arg Phe Glu Gln Pro Thr Glu Thr Pro Pro
 165 170 175

Tyr Ala Tyr Ile Tyr Thr Thr Tyr Leu Gln Glu Phe Phe Trp Asp Ala
 180 185 190
 15

Asn Asp Ile Tyr Tyr Glu Gln His Lys Ile Thr Ser Tyr Val Thr Glu
 195 200 205
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His Asp Thr Leu Leu Tyr Gln Glu Pro Met Ser Ile Tyr Val Tyr Arg
 210 215 220
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Ile Phe Ala Glu Leu Glu Gly Val Ile Ile Tyr Thr Arg Asn His Glu
 225 230 235 240
 30

Val
 30

<210> 318
 35 <211> 241
 <212> PRT
 <213> synthetic polypeptide
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<400> 318
 45 Asn Leu Val Pro Met Val Ala Thr Val Gln Ala Arg Leu Thr Val Ser
 1 5 10 15

Gly Leu Val Thr Glu His Asp Thr Leu Leu Tyr Tyr Ala Tyr Ile Tyr
 20 25 30
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Thr Thr Tyr Leu Gln Glu Phe Phe Trp Asp Ala Asn Asp Ile Tyr Val
 35 40 45
 55

Leu Glu Glu Thr Ser Val Met Leu Glu Leu Lys Arg Lys Met Met Tyr

106

	50		55		60	
5	Met Arg Ile Phe Ala Glu Leu Glu Gly Val Gln Glu Pro Met Ser Ile					
	65		70		75	80
	Tyr Val Tyr Ile Ile Tyr Thr Arg Asn His Glu Val Ile Met Arg Glu					
10		85		90		95
	Phe Asn Ser Tyr Lys Arg Arg Arg His Arg Gln Asp Ala Leu Ala Tyr					
		100		105		110
15	Ala Gln Lys Ile Phe Lys Ile Leu Ser Glu His Pro Thr Phe Thr Ser					
		115		120		125
20	Gln Tyr Gln Tyr Asp Pro Val Ala Ala Leu Phe Tyr Val Lys Tyr Val					
		130		135		140
25	Tyr Glu Ser Phe Asp Ile Tyr Arg Ile Phe Ala Glu Leu Asn Val Arg					
	145		150		155	160
	Arg Ser Trp Glu Glu Leu Lys Ala Arg Ala Lys Lys Asp Glu Leu Ala					
30		165		170		175
	Arg Val Tyr Glu Ile Lys Cys Arg Cys Pro Ser Gln Glu Pro Met Ser					
		180		185		190
35	Ile Tyr Val Tyr Phe Glu Gln Pro Thr Glu Thr Pro Pro Gln Ile Lys					
		195		200		205
40	Val Arg Val Asp Met Val Tyr Glu Gln His Lys Ile Thr Ser Tyr Gln					
		210		215		220
45	Ala Ile Arg Glu Thr Val Glu Leu Lys Ala Arg Asp His Leu Ala Val					
	225		230		235	240
	Leu					
50						

INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU02/00829

A. CLASSIFICATION OF SUBJECT MATTER		
Int. Cl. ⁷ : C07K 14/045; A61K 39/12, 39/295; A61P 31/12; C12N 15/00		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols)		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) STN, Medline, CA, WPIDS, BIOSIS (keywords: polyepitop?, epitop?, cytomegalovirus, CMV, HCMV, cytotoxic T lymphocytes, CTL.)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	Journal of Clinical Microbiology, Vol. 32, No. 2, Feb. 1994; Ripalti, A. et al, "Construction of Polyepitopes Fusion Antigens of Human Cytomegalovirus of ppUL32: Reactivity with Human Antibodies", pp. 358-363 See abstract and "materials and methods"	107-112, 142, 147
A	Microbiologica, Vol. 18, 1995; Ripalti, A. et al, "Construction of a polyepitope fusion antigen of Human Cytomegalovirus ppUL32 and detection of specific antibodies by ELISA", pp. 1-12. See summary and "materials and methods"	107-112, 142, 147
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C <input checked="" type="checkbox"/> See patent family annex		
<p>* Special categories of cited documents:</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier application or patent but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"&" document member of the same patent family</p>		
Date of the actual completion of the international search 17 October 2002		Date of mailing of the international search report 25 OCT 2002
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustralia.gov.au Facsimile No. (02) 6285 3929		Authorized officer GAVIN THOMPSON Telephone No : (02) 6283 2240

INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU02/00829

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	The Journal of Infectious Diseases, Vol. 181, 2000; Gyulai, Z. et al, "Cytotoxic T Lymphocyte (CTL) Responses to Human Cytomegalovirus pp65, IE1-Exon4, gB, pp150, and pp28 in Healthy Individuals: Reevaluation of Prevalence of IE1-Specific CTLs", pp. 1537-46 See abstract	107-112, 142, 147
A	Journal of Clinical Microbiology, Vol. 37, No. 1, Jan. 1999; Greijer, A. et al, "Molecular Fine-Specificity Analysis of Antibody Responses to Human Cytomegalovirus and Design of Novel Synthetic-Peptide-Based Serodiagnostic Assays", pp.179-188 See abstract and Table 1.	107-112, 142, 147
A	WO 94/23744 A (THE WISTAR INSTITUTE OF ANATOMY AND BIOLOGY and THE GOVERNMENT OF THE UNITED STATES OF AMERICA on behalf of THE DEPARTMENT OF HEALTH AND HUMAN SERVICES) 27 October 1994 See abstract	107-112, 142, 147
A	WO 98/21233 A (CITY OF HOPE) 22 May 1998 See abstract	107-112, 142, 147
A	WO 01/72782 A (CITY OF HOPE) 4 October 2001 See abstract	107-112, 142, 147

INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU02/00829

Box I Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos :
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claims Nos : 1 to 106, 113 to 141, 143 to 146, 148 to 270
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
So many peptide sequences are claimed - at least 318 - that a search that is more than 3 to 4 per cent of this total is economically prohibitive.
3. ☐ Claims Nos :
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a)

Box II Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

See attached sheets (as per attachment to "INVITATION TO PAY ADD. FEES").

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention mentioned in the claims as agreed; it is covered by claims Nos.:

107-112, 142, 147

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/AU02/00829

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report				Patent Family Member			
WO 94/23744	CA	2160583	US	5552143	AT	140154	
	CA	2012895	DE	69627695	DK	389286	
	EP	389286	ES	2091221	GR	3020765	
	US	5591439	WO	94/17810			
WO 98/21233	US	6074645	US	6156317	US	6251399	
	AU	74814/98	CA	2308118	EP	1023319	
	JP	2001519181	WO	99/19349	WO	01/72782	
	AU	49243/01	EP	946592			
WO 01/72782	AU	49243/01	US	6251399	EP	946592	
	WO	98/21233					
END OF ANNEX							